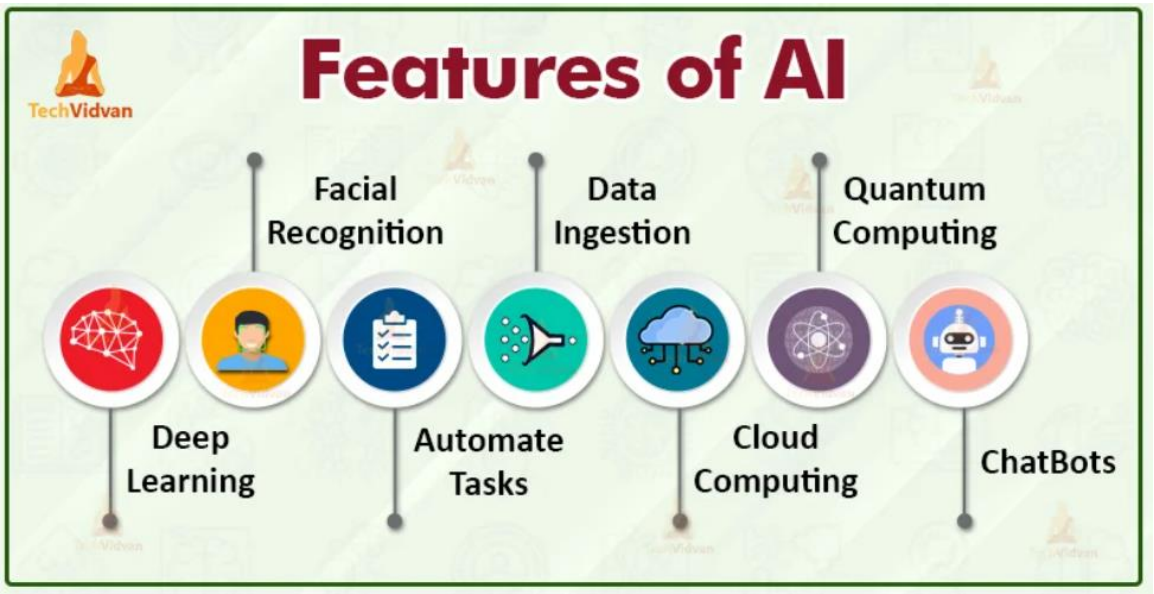
*Al-Hamdaniya University*

*College of Education*

*Computer Science*

*Stage: 3rd*

## ➢ Artificial Intelligence Characteristics




### 1. Deep Learning

Deep learning is a machine learning technique that teaches computers to do what comes naturally to humans, to learn by example. There are large numbers of fields of Artificial Intelligence technology like autonomous vehicles, computer vision, automatic text generation, and the like, where the scope and use of deep learning are increasing.

Take an example of Self Driving feature in cars like Tesla(Autopilot), where Deep learning is a key technology behind enabling them to recognize a stop sign or to distinguish a pedestrian from a lamppost.

## 2. Facial Recognition

Artificial Intelligence has made it possible to recognize individual faces using biometric mapping. This has lead to pathbreaking advancements in surveillance technologies. It compares the knowledge with a database of known faces to seek out a match.

For example, face ID can be used to authenticate purchases with Apple Pay and in the iTunes Store, App Store and iBooks Store. Apple encrypts and stores faceprint data in the cloud, but authentication takes place directly on the device.

## 3. Automate Simple and Repetitive Tasks

AI has the ability to execute the same kind of work over and over again without breaking a sweat. To understand this feature better, let's take the example of Siri, a voice-enabled assistant created by Apple Inc. It can handle so many commands in a single day!

The automation would not only lead to increased efficiencies but also result in lower overhead costs and in some cases a safer work environment.

## 4. Data Ingestion

With every passing day, the data that we are all producing is growing exponentially, which is where AI steps in. Instead of manually feeding this data, AI-enabled not just gathers this data but also analyzes it with the help of its previous experiences.

AI, with the help of neural networks, analyzes a large amount of such data and helps in providing a logical inference out of it.

## 5- Chatbots

Chatbots are software to provide a window for solving customer problems' through either audio or textual input. Earlier the bots used to respond only to specific commands. If you say the wrong thing, it did not know what you meant. The bot was only as smart as it was programmed to be. The real change came when these chatbots were enabled by artificial intelligence.

For example, Watson Assistant, an AI-powered assistant, developed by IBM which can run across various channels like websites, messengers, and apps and requires zero human intervention once programmed.

The chatbots not only offer services revolving around issues that the customers face but also provides product suggestions to the users. All this, just because of AI.

## 7. Cloud Computing

With such a huge amount of data being churned out every day, data storage in a physical form would have been a major problem. AI capabilities are working within the business cloud computing environment to make organizations more efficient, strategic, and insight-driven.

In simple terms, cloud computing is a range of services delivered over the internet, or "the cloud." It means using remote servers to store and access data instead of relying on local hard drives and private datacenters

For example, Microsoft Azure is one of the prominent players in the cloud computing industry.

## ➢ AI Programming Cognitive Skills

1- **Learning**: The acquisition of information and the rules needed to use that information.

2- **Reasoning**: Using the information rules to reach definite or approximate conclusions.

3- **Self-Correction**: The process of continually fine-tuning AI algorithms and ensure that they offer the most accurate results they can.

## ➢ Types of AI

1- **Artificial Narrow Intelligence (ANI):** Also known as Weak AI, it specializes in performing specific tasks and lacks general cognitive abilities.

2- **Artificial General Intelligence (AGI):** Refers to Strong AI capable of understanding, learning, and applying knowledge across various domains, similar to human intelligence.

3- **Artificial Superintelligence (ASI):** Hypothetical AI surpassing human intelligence in all aspects, potentially capable of solving complex problems and making advancements beyond human comprehension.

## ➢ The main areas of AI

1- **Machine Learning**: Involves algorithms that enable machines to learn from data and improve their performance without explicit programming.

2- **Natural Language Processing (NLP):** Focuses on enabling computers to understand, interpret, and generate human language.

3- **Computer Vision**: Deals with giving machines the ability to interpret and understand visual information from images or videos.

4- **Robotics**: Combines AI and mechanical engineering to create intelligent machines capable of performing tasks autonomously.

5- **Expert Systems:** Utilizes knowledge and reasoning to solve complex problems in specific domains, mimicking human expertise.

6- **Speech Recognition:** Involves converting spoken language into text or commands, enabling machines to interact with users through speech.

7- **Planning and Decision Making:** Focuses on algorithms that allow AI systems to make choices and optimize actions to achieve specific goals.